Name: Date:

Polynomial Factoring solution (version 682)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 22 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(22)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 88}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-72}}{2}$$

$$x = \frac{4 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{4 \pm 6\sqrt{2}\, i}{2}$$

$$x = 2 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 - 6i$ and $-2 + 8i$ in standard form $(a + bi)$.**

Solution

$$(-3 - 6i) \cdot (-2 + 8i)$$

$$6 - 24i + 12i - 48i^2$$

$$6 - 24i + 12i + 48$$

$$6 + 48 - 24i + 12i$$

$$54 - 12i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 13x + 10$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	2	-13	10
1		1	3	-10
	1	3	-10	0

$$f(x) = (x-1)(x^2+3x-10)$$

$$f(x) = (x-1)(x+5)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+1)^2 \cdot (x-3) \cdot (x-8)^2$$

Sketch a graph of polynomial $y = p(x)$.